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Mr. Friedrichs:

On behalf of the Environmental Resources Trust, Inc. (ERT), we are pleased to offer comments on the interim final 1605(b) Voluntary Reporting Program Guidelines released on March 24, 2005. This memorandum contains our comments on these guidelines, including specific comments related to projects involving the use of anaerobic digesters in agricultural settings.

ERT's experience in developing and operating a private registry of greenhouse gas (GHG) emissions and emission reductions affords us a unique perspective on the technical, legal and policy issues related to effective methods for measuring and registering real GHG emission reductions. We hope these comments will be helpful as the Department searches for an appropriate response to the President's February 14, 2002 Directive, wherein he called on the Department and other agencies:

> "…to recommend reforms to ensure that businesses and individuals that register reductions are not penalized under a future climate policy, and to give transferable credits to companies that can show real emissions reductions."

As an initial comment, it should be noted that the reforms recommended by the Department do not include any legislative recommendations. Instead, the Department has focused on incremental improvements to the existing system, particularly enhancements to measurement accuracy, reliability and verifiability. While these efforts have produced some impressive and creative approaches to handling the problems of a voluntary system, the effort could have been improved by discussion of legislative reforms that could lead to transferable credits. ERT believes that legislation leading to a compliance-based, nationwide, cap-and-trade system for greenhouse gas emissions is one of the best ways for the United States to address its contributions to global climate change and mitigate the dangers of global warming.

Overall, we have found the revised 1605(b) guidelines to contain numerous technical improvements in terms of the methodological details and consideration of greenhouse gas accounting issues. However, we have a number of concerns related to the way in which competing goals of the program have been defined and balanced. These competing goals are: 1) the program should be voluntary, 2) it should encourage the broadest level of participation, and 3) it should be capable of supporting a system of transferable credits at some time in the future.

It is clear that the design of the new 1605(b) guidelines, especially those related to the registration of emission reductions, focuses on a system for maximizing the credibility of registered emission reductions—given that the program is voluntary—without excluding anyone from participation. The treatment of indirect and avoided emissions and the requirement for entity-wide reporting are two examples of how DOE has attempted to increase the credibility of the program by attempting to address issues of double-counting and "cherry-picking," respectively.

However, these goals are in some ways conflicting with the goal of having a program that can produce credible transferable credits in the future. Specifically, we do not support the exclusive focus on entity-wide reporting. Without a requirement to furnish facility-level data as the primary focus of the program, the emission reports submitted under 1605(b) will be unverifiable (and hence useless) for crediting under a future emission trading or other compliance programs. Information indicating entities with ownership and or control relationships for each facility can also be included in the 1605(b) registry. We strongly encourage DOE to revise the 1605(b) guidance to include a requirement for reporting facility-level data.

We suggest that DOE eliminate guidance on the reporting of indirect emissions from electricity (and steam) from the guidelines. Instead 1605(b) should include provisions for reporting on the actual kWh of electricity (or tons, temperature, and pressure of steam) consumed. This approach will simplify reporting and eliminate the complications of double counting, while still preserving the data necessary to account for improvements in energy efficiency.

We are also concerned with the lack of a clear signal that EIA (or DOE) will undertake measures to review the information submitted under the program to ensure its credibility and accuracy. It is our understanding that neither DOE nor EIA plans to review or audit the reports in any detail. Although independent 3rd party verification can help in this matter, it is not a substitute for DOE and EIA taking their role of protectors of the public trust, in the form of ensuring that accurate and transparent information is available. We strongly encourage both DOE and EIA to allocate the resources and put in place the procedures for a rigorous review process for information submitted and registered under the 1605(b) program.

Unless DOE and EIA are able to fully implement a rigorous review process for all information submitted under the 1605(b) program, we further suggest all of the provisions in the guidelines related to "registering" reductions be eliminated. Instead focus the 1605(b) program should be on "registering" high quality facility-level (or equivalent location-specific level for non-stationary sources) emissions (or removal) data. The guidelines can also permit less rigorous emission reduction data to be "reported" on a voluntary basis. This change in focus in what is "registered" is important because it is more consistent with a future program of real transferable credits."

In summary, we believe that the Department failed to meet the President's challenge: to develop a system capable of providing baseline protection for early action. This failure is inherent in the approach – without new legislative authority the Executive Branch currently lacks authority to assure that current efforts to reduce GHG emissions will receive credit under a future law. Furthermore, years of experience with a host of voluntary programs at the state and federal level have demonstrated that voluntary reporting systems fail to stimulate economy-wide reductions—most emitters will simply not participate in a voluntary program, especially when baseline protection is not an explicit promise. Without a requirement for mandatory reporting the problems of incomplete reporting, leakage and potential gaming of the system are too difficult to address, despite the Department's often-noteworthy efforts to do so. Mandatory reporting for large emitters must be included to ensure a comprehensive, consistent emissions inventory system capable of providing transferable credits under a future compliance system.

Having made these overarching policy comments, the bulk of our remaining comments address the specific issues raised in the president's charge and the notice of inquiry within the context of this fundamental conclusion. Our comments first address issues pertaining to achieving a comprehensive and accurate inventory of global warming emissions from U.S. entities. We then address issues raised by proposals to avoid penalizing early movers and to give out "early credits" usable against future cap and trade obligations. Finally, we address additional elements of a credible entity-wide reporting system.

We hope these comments are useful and please feel free to contact us with any questions.

Sincerely,

Michael Gillenwater
EcoRegistry Program Director

Wiley Barbour
Executive Director

Attachments: Detailed comments

Reporting level of detail

- Reporting under the 1605(b) program should focus on facility-level data while also supporting entity-wide reporting. Information indicating entities with ownership and or control relationships for each facility can also be included in the 1605(b) registry to support entity-wide aggregation of emissions data. Any future emissions trading system for carbon dioxide and/or other greenhouse gases will necessarily operate at the facility-level, not corporate entity level, in order to be legally and administratively feasible. In order for the information reported to 1605(b) to be effectively linked to a future mandatory emission trading or other similar crediting program, the retention of facility-level data will be critical.
- Within the context of a voluntary system, though, it is logical for DOE to shift the focus of the 1605(b) program to entity-wide reporting in order to minimize (although not eliminate) the effects of "cherry-picking." Any future mandatory program will necessarily be facility-based, in keeping with all other existing regulatory permitting programs. The currently proposed 1605(b) guidelines, with their lack of reporting of facility-level data, will lead to a situation where 1605(b) reported inventory estimates and registered reductions will, in many cases, be useless for the establishment of a mandatory emissions trading program in the future. EIA should collect and archive such facility-level data in support of entity-wide reporting and not prejudge the future use of such data. Reporters and registrants to 1605(b) can be given the choice, if administratively or legally necessary, to withhold facility-level data, but the 1605(b) guidance should inform them that the failure to report facility-level data will severely reduce the likelihood of them ever receiving any form of transferable credit under a future mandatory program.
- The lack of facility-level data in entity-wide reports, as currently specified in the guidelines, is likely to preclude the use of much of the data reported (and reductions registered) under the program from being verifiable (an explicit goal of the program) for large entities that will be aggregating emissions data over multiple facilities, jurisdictions, and geographic locations. It will also likely make much of the data in 1605(b) useless to State and local governments. These problems would be eliminated with a requirement to report facility-level data along with entity-wide reporting.
- The guidelines treat nuclear power, for the purpose of calculating emission reductions on an intensity basis, the same as it treats renewable generation technologies. Without facility-level data, it is not clear that it will be possible, within an entity's report, to distinguish emission intensity reductions due to the generation of electricity from nuclear power plants and those from renewable energy generators. DOE should add a requirement for electricity (as well as steam and chilled water) generators to report facility-level data along with their entity-wide data to preserve this data and distinction so as not to prejudge any decisions for possible future regulatory schemes.
- DOE and EIA should not permit concerns over confidential business information (CBI) to prevent the 1605(b) program from collecting and maintaining facility-level data. If necessary, DOE and EIA should develop additional CBI protection procedures so as to ensure that the information reported to the program has a viable use in the future.

Entity definition and boundaries

- Although the guidelines definition of "entity" does provide some clarity as to the legal basis for reporting, it does not necessarily clarify what specific physical activities and facilities would be covered under that entity. The guidelines leave it up to reporters as to how they should treat leased and other more complex legal ownership and operating arrangements. Such lack of clarity will inevitably lead to inconsistency in reporting across entities. It also indicates the critical

importance of facility-level data in disentangling these complexities if the data is to be used in the future for any form of transferable credits. We encourage DOE to elaborate more detailed guidelines, possibly including some case studies, as to how the definition of entity can be operationalized for actual reporting of emissions and removals.

- Within the context of entity-wide reporting, it is essential that provisions requiring adjustments for acquisitions, divestures, and other changes that affect the organizational boundaries of the entity be maintained. DOE and EIA should be cognizant, however, that this requirement will result in most medium and large entities making significant revisions to their reports every year. These revisions will also add to the burden on both reporting organizations and on EIA to process this information. These burdens are unavoidable with an entity-wide approach.
- We question the ability of the Simplified Emissions Inventory Tool (SEIT) to fulfill its advertised role. It will likely prove difficult in practice to develop a tool that avoids a great deal of ad hoc support to users. It is also not clear how it will significantly reduce the data collection burden on businesses, in that they will still be required to collect most of their data prior to using the tool. We encourage DOE clarify how the SEIT will function and provide the public with some example case studies of small, medium, and large entities at the earliest date possible.
- In "Figure 1: Check list for registering emission reductions" both large and small emitters are shown to equal to 10,000 tons. Small entities should be less than (but not equal to) 10,000 tons.

Aggregators

- In §300.2, it would be useful to supply a description and definition for partnerships with third parties, as well as several examples of how to apply these definitions in practice.
- In §300.3, it would be helpful to provide more guidance on the definition of entity when partnered with third parties to report emission reductions.

Base period issues

- In contrast to DOE's statements in the federal register, allowing pre-2002 reporting under the 1605(b) program will not necessarily degrade the transparency or verifiability of reported data, as long as adequate data quality standards are elaborated and enforced. DOE should not prejudge the ability for reporters to meet the standards set out in the guidelines for earlier reporting years as far back as 1990. If an entity or facility owner has the necessary data to meet the requirements of the guidelines and has reduced emissions relative to some pre-2002 historical baseline, should be able to register. DOE does not provide an adequate justification for excluding pre-2002 (or 1999 in the case of a 4 year base period) data from registering reductions.
- Reporters should also be given the flexibility to establish base values that are more stringent than those derived from historical performance data during the base period.

De minimus

- EIA should reinstate the absolute magnitude of emissions test (i.e., 10,000 metric tons) as well as the percentage test (i.e., 3%) for its *de minimus* criteria. It makes no sense for a large entity to be able to exclude emissions which may be equivalent to dozens of small entities.
- DOE should also consider the impact of its *de minimus* rule on the time series consistency of reported emissions data. We believe that this *de minimus* rule requires more detailed guidance on it application so as to prevent reporters from manipulating it over time to avoid reporting increases in emissions over time. At the extreme, a reporter could hide up to a 3% increase in emissions by manipulating what emissions it treated as de minimus. Ideally, several example

case studies may best illustrate how rules should be established to prevent abuse of the *de minimus* rule. Alternatively, the *de minimus* should be completely eliminated if DOE is incapable of elaborating rigorous criteria and detailed guidance for its use.

Calculation of reductions

- In an attempt to increase the credibility of a voluntary-based reporting program, DOE has biased the 1605(b) guidelines for calculating emission reductions towards to an intensity-basis versus absolute basis (Technical Guidelines sections 2.2.2.1 and 2.4.2). DOE stresses the use of emissions intensity per unit of some unspecified type of input or output (units are specified for electricity and heat generators). Due to the nature of a voluntary program, such a stress makes sense in order to prevent reporters from registering reductions simply for drops in output (or inputs). However, reporters should be made cognizant that any future mandatory program is less likely to award credit on an intensity basis. DOE illustrates the problems with estimating emission reductions on an intensity basis in their inability to explicitly specify denominators that are required to be used. The flexibility in the selection of intensity metric is likely to significantly reduce the credibility of reported reductions to the 1605(b) program due to the ability of reporters to manipulate these metrics, through their selection of the intensity denominator. It will also be difficult to compare this type of emissions data across facilities and industries. Reporters may also find it difficult to select an intensity metric. And once selected, these metrics may not be perfectly linear in their relationship to emissions. This lack of linearity, in many cases, may result in emissions decreasing due to increases in output. DOE should reconsider this stress on intensity-based reporting and instead focus on collecting data on absolute emissions at the facility-level.

- DOE has proposed an innovative intensity-based approach (using both a historical baseline intensity value and an industry benchmark) to deal with the problem of double counting between the direct emission reductions from electricity generators and the indirect emission reductions reported by electricity end-users. This approach is reasonable effective at dealing with this double counting problem; however, it both 1) establishes an intensity-based emissions accounting approach for electricity generators, and 2) establishes the expectation that downstream electricity consumer are entailed to emission allowances or credits in any future emissions trading program. In attempting to design a more credible voluntary registry, DOE is unfortunately laying the foundation for a system that prejudges the design of a future mandatory program (which is more likely to focus the bulk of emissions accounting responsibility to upstream fuel consumers or producers). DOE should clearly indicate in writing to reporters under the 1605(b) program that in no way does the format under which emission reductions are calculated imply that a future mandatory program will follow a similar calculation format, and that quite the contrary, it is likely to use a different format, focusing more on absolute emission reductions at a facility-level.

- Because of the inherent double counting problems and uncertainty in the actual emissions intensity of electricity consumed by end-users, DOE should simply register the electricity consumption of reporters instead of converting electricity data to indirect emissions (similarly with process heat and steam). Such an approach avoids prejudging how any future program may wish to convert—if at all—electricity consumption to emissions. It is unnecessary to the integrity of the 1605(b) program to convert electricity consumption to indirect emissions, especially given the inherent uncertainties in any indirect emission factor.

- However, if 1605(b) allows indirect emissions to be reported, then DOE should revise the 1605(b) indirect emissions calculation guidelines to be based on a single constant (over reporting years and geography) indirect emissions factor (i.e., metric tons CO_2/MWh). This factor could be based on a national average or some other reasonable benchmark. Requiring the use of more regional factors provides reporters with a false impression of accuracy and is biased against

emission reductions in the West and Northeast. The use of indirect emission factors that change over time allows reporting of emission reductions solely based on factors outside the control of the reporting entity.

- There may be cases where a national average indirect emissions factor for electricity consumption will not be legitimate. For example, when reporting emissions from foreign operations small countries may import most of their electricity and therefore will not present a representative factor. We encourage DOE and EIA to simply register the quantity of electricity (or heat) consumed instead of registering indirect emissions from international operations. If DOE chooses to include indirect emissions in 1605(b) then it should set a global benchmark (e.g., based on a global average) indirect factor instead of complicate the guidelines and present a false sense of accuracy with geographically and temporally varying factors for reporting emissions or reductions from overseas entities and sub-entities.
- We find the new ranking system in 1605(b) to be an improvement in terms of encouraging inventory quality improvements. However, the averaging of various source categories using the ranking values (i.e., 1, 2, 3, and 4) is problematic in that it mixes source categories of widely varying uncertainties. Although the guidelines state that it is an "ordinal" ranking system (i.e., rankings are not comparable across source categories), the guidance is internally inconsistent because it then uses these values in a blatantly cardinal fashion (i.e., averages the ranking values across source categories and methodologies quantitatively). DOE should make it explicitly clear in the guidelines that despite receiving an A or B ranking (i.e., 3 or 4), the estimates from a particular source or sink category cannot be assumed to be of an equivalent quality to estimates another category with the same ranking. Future mandatory schemes may choose to exclude (or treat differently) certain categories or actions.

Transferable credits

- DOE states that the main distinction between simply reporting emissions and registering reductions is the degree to which "individual reports cover all of the entity's emissions and emission reductions." If this is the main distinction, then it is unclear why DOE created a system for registering reductions at all, and instead did not instead simply create a second tier of reporting that required parties to report entity-wide. The fact that the guidance focuses so heavily on estimating reductions (versus just emissions) clearly implies that the main motive for creating the registry function in 1605(b) is the establishment of a future system of transferable credits. However, the lack of facility-level data and the focus on intensity-based metrics results in a program that is unlikely to be able to support credible transferable credits. Therefore, the current design of the 1605(b) program does not support the President's call for a program that supports "transferable credits" (e.g., future mandatory emissions allowance trading system).

Project (activity) reporting

- We support the inclusion of a requirement that project-level emission reductions must meet a regulatory additionality test—in the form of a description and attestation by the reporting entity.
- Although it is discouraged, it is not clear from the guidelines what steps DOE or EIA will take to make determine whether an entity is legitimate in using an Actions-Specific Calculation Method (section 2.4.5) versus one of the other methods. At the extreme, it appears that there are no strict criteria preventing any and all reporters from broadly claiming emission reductions using an activity-based method.
- DOE should consider additions to the list of action-specific reduction activities. Other projects types than the ones listed can lead to unambiguous emission reductions that are independent of actions taken by external parties. Two examples of such projects not listed in the guidelines are:

1) anaerobic digester operations and 2) the substitution of halogenated substances contained in manufactured products. Anaerobic digesters are an example of projects, like landfill gas methane, that the implementation of a technology has a clear impact upon a specific type of emissions. The substitution of an HFC, PFC, or SF_6 in a product with a non-greenhouse gas, lower-GWP greenhouse gas, or non-in-kind technology, can lead to unambiguous emissions reductions in cases where the gas is know to eventually be emitted from the product (i.e., emissions are unaffected by the purchaser of the product, and therefore only under the control of the manufacturer through its choice of gas).

- It is not clear how an entity (large or small) that does report entity-wide emissions should combine emission reductions reported using an action-specific method with their emission reductions reported on an entity-wide basis so as to avoid double counting. DOE should clarify how to handle such situations.

Reporting, transparency, and record retention

- We support the reporting and maintenance of all emissions data according to whether it is the result of direct, indirect, avoided, offsets sources. We also support that data be reported and maintained according to individual source and sink categories so as not to prejudge any future regulatory decisions. A more effective program would also collect and maintain data on a facility-level basis.
- We especially commend the separate reporting of direct and indirect emissions (assuming indirect emissions are reported as emissions at all). It is essential that this distinction be clearly maintained at all levels of reporting in order to avoid tainting direct emissions data with any double counting problems. It is also important that information on the geographic location, source (or sink) category, and year be reported in a consistent manner across all of these dimensions.
- DOE should reconsider the requirement that supporting records only be maintained for 3 years by reporters and registrants. Reporters and registrants may still only be required to maintain records for 3 years, but they should be encouraged to maintain them longer and informed that the failure to maintain them may prevent them from receiving any form of transferable credit should the information they report need to be verified for some future mandatory program.
- DOE should elaborate specific record keeping and archiving requirements for records related to base period data. Because of the importance of this base period for any registered reductions, it is essential that this information be preserved for more than the 3 year minimum if reported reductions are to have any credibility in the future.
- We support the requirement that reporters submit information on any regulations that may have required the entity to take actions that lead to emissions reductions. Information on this basic additionality test is critical to preserve.
- We also support the inclusion of a statement attesting to the fact that any reported emission reductions were not the result of leakage—shifting emissions to non-reporting entities (§300.10(c)(3)) in an entity's certification report. However, in practice, large entities may find fulfilling this requirement, with any level of certainty, difficult.
- We support the requirement that reporters indicate whether emission reductions were the result, in whole or part, of plant closures, voluntary actions, or government requirements.
- We believe that DOE and EIA vastly underestimate the likelihood that confidential business information (CBI) will become a significant problem for the 1605(b) program. Because of the greatly increased specificity of the program, it is likely that either 1) far more requests for

protecting CBI will result or 2) companies will withhold significant quantities of information from their reports that is critical to transparency. DOE should elaborate more explicit guidance and procedures for dealing with CBI issues.

- We support the requirement that a corporate officer sign and attest (i.e., certify) the reports submitted to EIA under 1605(b).
- In §300.6 (j) the last sentence should be revised to read "…Entities [must] also provide the physical quantities of each type of purchased energy covered by their report." It is essential that this physical quantity data be reported due to the uncertainty in indirect emission estimates and to preserve the transparency of reporting.
- DOE should more explicitly elaborate under what circumstances reporters can use §300.7(b)(2) that allows them to exclude activities from their reports. Does DOE foresee other circumstances beyond the addition of new plant as legitimate grounds for exclusion?
- We support the requirement that reporter submit report every year, once a base value has been established, so as to avoid "cherry picking" only "good years" and to ensure the permanence of terrestrial and geological carbon stocks.

Review and verification

- Although it is encouraged, 1605(b) leaves the decision of obtaining 3rd party verification up to reporting parties. The guidelines state that reporters should select verifiers that have been approved by some type of accreditation organization. This statement in the guidelines, though, is not a substitution for the elaboration of specific verification requirements. Because of the lack of uniform verification standards for entity-level greenhouse gas inventories, even the provision of 3rd party verification by a reporting entity is not a reliable signal that they have satisfied a uniform data quality standard. There is currently a lack of broadly accepted verifier accreditation standards and the rigor of independent verification varies widely and is primarily a function of who is hired as a verifier and how much the entity chooses to pay.
- By encouraging reporting entities to obtain independent 3rd party verification, DOE has improved the 1605(b) guidelines. However, 3rd party verification is not a substitute for a rigorous review system of submitted reports on the part of DOE and or EIA. It is our understanding that neither DOE nor EIA will take any steps to review, verify, or audit any of the information submitted under the 1605(b) program beyond simply checking that submitted forms are complete. This situation will likely lead to a result that the data in the 1605(b) registry will be unreliable and not credible in the eyes of stakeholders should it ever be proposed to be used for government created transferable credits. We encourage DOE and EIA to allocate the resources necessary to thoroughly review all of the information submitted under the 1605(b) program.
- DOE and EIA should clearly elaborate exactly what steps they will take to review reports submitted under 1605(b) (§300.12(a)). It is not clear that EIA has the resources to ensure the quality or accuracy of any of the information reported under the 1605(b) program.
- DOE and EIA should be prepared to handle and process the large quantity of information that should be submitted each year to transparently document the changes in entity boundaries that will likely occur for many medium and large entities. Many entities undergo significant changes in their operations on a continual basis. Facilities may change ownership several times in a single year, yet, no clear guidance is provided as how to deal with these situations. Large entities will likely be in a constant state of revising their submissions to deal with changes in ownership and technologies.

- Although the guidelines require entities to provide a large number of justifications in their reports—regarding additionality, leakage, entity boundary changes, the selection of intensity metrics, the selection of emission reduction calculation methods, and others—it does not appear that DOE or EIA will fulfill any significant role of evaluating the accuracy or legitimacy of these justifications on behalf of the public. DOE and EIA should be explicit in the guidelines (or other appropriate written program documentation) as to the exact steps it will take to evaluate and verify the accuracy of reported information.
- It will be critical that the forms being developed by EIA provide for rigorous and detailed documentation to support the wide diversity of reporting options provided by the 1605(b) program. Because of the inherent ambiguity and complexity of reporting emissions and reductions on an entity-wide basis, however, EIA and DOE may find that reporting entities find the reporting forms enormously burdensome. EIA and DOE may also find that the task of reviewing and archiving the information reported under the program to be an enormous task. We are concerned that EIA lacks the institutional capacity to properly administer such an enormous task.
- If DOE elects to retain the *de minimus* option in the guidelines, then both DOE and EIA must ensure that adequately rigorous review processes are put in place to both ensure the proper application of the *de minimus* standard and that no significant biases in calculated emission reductions result from its use (or abuse).

Terrestrial carbon

- We support the decision not to allow the "up-front" registration of forest carbon sequestration. To enhance credibility, 1605(b) should be consistent with the principle of only registering emissions and removals that are based on verifiable historical data.
- DOE should eliminate the method for calculating the carbon stored in harvested wood products using a projected 100 year time frame, at least for the purpose of registering reductions. The claims of carbon storage reported under this rule would be unverifiable, and the actions that result in carbon storage of harvested wood products are rarely under the control of the wood harvester.
- We support the requirement that terrestrial carbon stocks that are lost and claimed to be due to natural disturbances first be recovered before reporters can include them in their registered reductions.
- Reporters may be surprised to find the requirement listed in Technical Guidelines 2.4.4.4 that requires them to report on changes in the carbon stocks on incidental lands. DOE may wish to highlight this requirement to reporters and illustrate some examples of the circumstances under which this requirement would go into effect.

Definition of greenhouse gases

- DOE should reconsider its definition of greenhouse gases. There is a great deal of scientific uncertainty as to the how to quantify the specific radiative forcing impact of aerosol particles. DOE also incorrectly refers to "climate forcing" when the proper language is "radiative forcing," in keeping with the Intergovernmental Panel on Climate Change (IPCC). Currently, there is no scientific consensus as to how indirect effects on radiative forcing can be incorporated into a revised Global Warming Potential (GWP). Universally, the GWP values used are those developed by the IPCC that represent the direct radiative forcing impact of long-lived atmospheric gases. In the case of aerosols, there is even no uniform format for measuring and reporting the mass of emissions that is easily comparable because of the sensitivity of impacts to location, meteorology, particle size, location, particle composition, etc. Although these problems

could conceivable be overcome to some degree with further scientific developments, DOE should add language to the guidelines that it will limit the addition of any gases or aerosols to those that have "direct GWP values that are widely accepted by the scientific community [and/or] the Intergovernmental Panel on Climate Change."

- DOE and EIA should also be aware that the new IPCC guidelines for national greenhouse gas inventories will likely include a definition of indirect greenhouse gas emissions that differs from the one presented in the 1605(b) guidelines. These indirect emissions include: 1) indirect carbon dioxide (CO_2) emissions that result from the atmospheric oxidation of the carbon in methane (CH_4), CO, and NMVOC emissions; and 2) indirect nitrous oxide (N_2O) emissions that result from the redeposition of the nitrogen in NO_x and ammonia (NH_3) emissions to soils and surface waters, which then enhances the production of N_2O through microbial action.

Stationary combustion

- In the Technical guidelines chapter 1, Part C: Stationary Source Combustion, DOE incorrectly refers to the factors to estimate CO_2 emissions from fuel combustion as "emission factors." The correct terminology is "carbon content factors" in cases where an oxidation factor is also used.
- In the Technical guidelines chapter 1, Part C: Stationary Source Combustion, Table 1.C.4, DOE incorrectly references data on oxidation factors as IPCC factors, implying that they are IPCC defaults. The default oxidation factor in both the EIA and EPA national inventory for coal combustion is 99% and the IPCC default is 98%. DOE should clearly indicate that the data presented in this table are from a single British study and was not adopted by IPCC as default values. Unless facility-specific measurements are made, reporters under 1605(b) estimating stationary combustion emissions from coal should use the U.S. national inventory default of 99%.

Comments on Chapter 1: Part H - Agricultural Emission and Sequestration

- The methods presented for livestock sources are referenced as EPA 2003b and appear to be taken from EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2001* (April 2003). We were not able to locate a specific reference list in the 1605(b) Technical Guidelines. In general, it is appropriate for the accepted methods to be consistent with methods used by EPA for the national inventory and with general guidance provided by the IPCC. However, it should be noted that several changes in methods and factors have been incorporated into the annual EPA inventory since 2003, which should be reflected in the final guidance. In addition, IPCC is currently updating international guidelines (scheduled for publication in 2006) which reflect these more recent changes. Alternatively, DOE/UDSA should include language to the Technical Guidelines to state that the methods presented may be superseded by more up-to-date methods published by EPA and/or IPCC.

Enteric Fermentation

- Ensure that the values presented in Table 1.H.4 are updated to reflect EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2003* (April 2005).
- Factors presented in Table 1.H.5 are from the 1996 IPCC Guidelines (not the 2000 Good Practice Guidelines) and are for developed countries. It would be useful to reference the specific table citation as well (Table 4-3).
- The swine emission factor presented in Table 1.H.5 should be [1.5], not [1].

Livestock Waste – General

- In general, emission estimation techniques that are based on a generalized non-US emission factor (kg gas per head per year), such as those presented in Table 1.H.8, should be rated as "B", and techniques that use either US-specific or site-specific data to estimate the emission factor should be rated as "A".
- Note that data based on either the 1996 IPCC Guidelines or the 2000 IPCC Good Practice Guidelines are subject to change based on revisions currently being made to the 2006 IPCC Guidelines. These changes greatly affect default emission factors for methane and nitrous oxide from manure management.

Livestock Waste – Methane

- Table 1.H.8 presents default emission factors for developed countries from the 1996 IPCC Guidelines (Table 4-5). At a minimum, the Technical Guidelines should include the specific citation from where the factors are taken (so that users can determine in the future if there is updated information available).
- Ideally, Table 1.H.8 should be updated to reflect EPA's 2003 emission estimates for the United States. EPA updated the estimation techniques for sheep, goats, and horses in the 2003 inventory, which affects the overall methane emission factor.
- Due to EPA's changes in the 2003 Inventory, Table 1.H.9 can be expanded to include sheep, goats, and horses.
- Table 1.H.10 presents VS rates by state and cattle group. EPA has updated these rates in the 2003 Inventory (Table 3-90).
- Table 1.H.11 presents methane conversion factors (MCFs) for three types of systems: pasture/range/paddock, drylot, and "liquid" systems. It is unclear what the origin of these MCFs is as they do not match the MCFs used in EPA's 2001 Inventory (presumably the reference noted as EPA 2003b). EPA's methodology does not use state-specific MCFs for dry systems, including pasture/range/paddock and drylot systems. To date, EPA has used the IPCC default MCFs for temperate climates for all dry systems modeling for the U.S. Inventory. Specifically, EPA used an MCF of 0.015 for pasture/range/paddock systems and drylot systems, not the list of MCFs provided in Table 1.H.11.
- Table 1.H.11 also presents MCFs for "liquid systems." It is unclear what type of liquid system these MCFs are intended to represent: anaerobic lagoons, liquid/slurry systems, or deep pits. However, the MCFs are incorrect. EPA uses state-specific MCFs for liquid/slurry and deep pit systems, as well as for anaerobic lagoon systems, which differ from the state-level MCFs presented in Table 1.H.11. The most recent version of the EPA MCFs are presented in Table 3-97 of the 2003 Inventory and should be used in place of the values in Table 1.H.11.
- Table 1.H.12 presents IPCC default MCFs for select management systems, including pit storage. However, EPA has estimated state-specific MCFs for liquid/slurry and pit systems, which can be found in Table 3-97 of the 2003 Inventory. These state-specific MCFs should be included in Table 1.H.11 and removed from Table 1.H.12.

Livestock Waste – Nitrous Oxide

- Section 1.H.4.1.3.2 presents an "A" rated approach that is based on a set of emission factors in Table 1.H.13 for which there is no documentation presented or cited. The emission of N_2O from livestock operations is directly connected to the amount of nitrogen excreted from the animals, as well as the method in which that manure is managed. Nitrogen excretion rates vary greatly

between dairy cows, dairy heifers, feedlot cattle, and nonfeedlot cattle, which affects the rate of nitrous oxide emission potential. These differences are not adequately captured in the animal groups presented in Table 1.H.13. For example, this table suggests that any type of poultry should receive an emission factor of 0.02 kg N_2O per year, regardless of whether it is a 2-pound broiler chicken or a 15-pound turkey. EPA's estimates of nitrous oxide emissions for these two poultry groups range from 0.01 to 0.06 kg per head per year.

- The nitrous oxide emission estimation technique would be greatly improved by providing default nitrogen excretion rates by animal type and by weight class (i.e., nitrogen excreted by mass of animal), default N_2O emission factors, and the basic calculation of population multiplied by nitrogen excretion multiplied by the nitrous oxide emission factor.